CLIENT INITIATED VENDOR VERIFIED TOOL SETTING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims the benefit of U.S. Provisional Patent Application 62/218,611 filed Sep. 15, 2015 entitled "Client Initiated Vendor Verified Tool Setting", the entire contents of which are incorporated herein by reference.

FIELD OF THE INVENTION

[0002] This invention relates to machine tool settings and more particularly to the provisioning of original equipment manufacturer validated tool settings and configurations generated by customers.

BACKGROUND OF THE INVENTION

[0003] Numerical control (NC) is the automation of machine tools that are operated by precisely programmed commands encoded on a storage medium, as opposed to controlled manually via hand wheels or levers, or mechanically automated via cams alone. Most NC today is computer (or computerized) numerical control (CNC), in which local and/or remote computers provide the data files for execution by the machine tool(s). CNC systems allow end-to-end component design to highly automated using computer-aided design (CAD) and computer-aided manufacturing (CAM) programs. The programs produce a computer file that is interpreted to extract the commands needed to operate a particular machine via a post processor, and then loaded into the CNC machines for production.

[0004] As a particular component might require the use of a number of different tools, e.g. drills, saws, etc., modern machines often combine multiple tools into a single "cell". In other installations, a number of different machines are used with an external controller and human or robotic operators move the component from machine to machine. In either case, the series of steps needed to produce any part is highly automated and produces a part that closely matches the original CAD design.

[0005] However, CNC relies upon the settings of the machine tool or tools required to achieve a specific action with respect to the piece part are well established, characterised, and reproducible machine tool to machine tool. For example, a drill tool commanded to move a piece part 1" (25 mm) and drill a 5/32" (4 mm) hole into 0.25" (6.25 mm) aluminum plate would be expected to achieve that without issue. However, cutting a 1" (25 mm) hole in 1" thick steel with a 1.5" (37.7 mm) chamfered profile on one side with a 0.5" (12.7 mm) plasma torch in a 2" (51 mm) square well may yield unpredictable results using the standard process. However, one manufacturing facility may have solved the issue through adjustments that they have made or has established a methodology to adjust a process to accommodate tool wear. But no one else knows this and must expend their own efforts to establish improvements.

[0006] Accordingly, it would be beneficial for manufacturers to be part of a service, free or subscription for example, that provide access to updated process parameters for machine tools that reflect scenarios encountered in manufacturing operations that are unusual, outside those the machine tool vendor specified, or are completely new as new materials, machine tool elements etc. are introduced. It would be further beneficial for the other manufacturers subscribing to the service to have confidence in the machine tool settings. Accordingly, it would be beneficial if the subscription service allowed manufacturers to access verified settings where the verification is performed by the machine tool manufacturer or machine tool element manufacturer.

[0007] Other aspects and features of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of specific embodiments of the invention in conjunction with the accompanying figures.

SUMMARY OF THE INVENTION

[0008] It is an object of the present invention to mitigate limitations within the prior art relating to machine tool settings and more particularly to the provisioning of original equipment manufacturer validated tool settings and configurations generated by customers.

[0009] In accordance with an embodiment of the invention there is provided a method of providing control settings for an original equipment manufacturers (OEM's) machine tool by making them available to subscribers of a subscription service wherein the control settings were initially established by a user of the OEM's machine tool and validated by the OEM prior to their being available to subscribers of the subscription service.

[0010] In accordance with an embodiment of the invention there is provided a database comprising a machine tool control setting profile of a plurality of machine tool control setting profiles, each machine tool control setting profile established by a user of the machine tool and validated by the original equipment manufacturer.

[0011] In accordance with an embodiment of the invention there is provided executable software stored upon a non-transient physical medium, wherein the executable software when executed performs a process, the process comprising the steps of:

[0012] performing a hash upon local control settings relating to a predetermined process upon a machine tool, the local control settings stored locally to the machine tool;

[0013] performing a hash upon reference control settings relating to a predetermined process upon a machine tool, the reference control settings stored remotely to the machine tool by either an original equipment manufacturer of the machine tool or a machine tool element provider for the machine tool;

[0014] determining whether the local control settings are different from the reference control settings by comparing the hashes of the local control settings and the reference control settings; and

[0015] upon a difference being detected at least one of:

[0016] automatically replacing the local control settings with the reference control settings;

[0017] providing an operator of the machine tool with an override option; and

[0018] providing an operator of the machine tool with an option to indicate that the local control settings provide improved performance relative to the reference control settings and upon said indication pushing the local control settings to the one of the original